CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

ORDER NO. 87-142

SITE CLEANUP REQUIREMENTS FOR:

HEWLETT-PACKARD 640 PAGE MILL ROAD
VARIAN ASSOCIATES 601 CALIFORNIA AVENUE
STANFORD UNIVERSITY
PALO ALTO
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), finds that:

1. Stanford University, has owned the Stanford Research Park property since 1885. The Research Park consists of 655 acres with approximately 60 tenants. Most of the tenants have long-term 51- or 99-year ground leases and own the buildings on their sites.

2. Varian Associates manufactures electronic components at a site located at 601 California Avenue, Palo Alto, Santa Clara County. The site is located within Stanford Research Park and is leased from Stanford University the current owner of the site.

3. Hewlett-Packard, operated a manufacturing facility for electronic components at a site at 640 Page Mill Road in Palo Alto. The 640 Page Mill Road site is located within the Stanford Research Park.

4. The groundwater on-site and off-site of these two companies are polluted with organic solvents believed to have orginated from past activities at solvent storage and use areas. The on-going investigations have detected trichloroethylene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethylene (DCE), 1,1-dichloroethane (DCA) in monitoring well samples.

5. Varian Associates, Stanford University, and Hewlett-Packard are hereinafter referred to as the dischargers.

6. Stanford Research Park is located between El Camino Real and Foothill Expressway to the north and south with California Avenue and the Barron Park Community to the west and east. The Research Park is located on a series of overlapping alluvial fans deposited by east-flowing streams along the edge of the foothills of the Santa Cruz Mountains west of the Park.

7. The area is underlain primarily by continuous interbeds of unconsolidated clayey to silty sand and sandy clays. The uppermost saturated zone was encountered at approximately 17 to 20 feet deep. The groundwater gradient in this zone is northeast toward the San Francisco Bay.

8. The on-going groundwater investigations of Hewlett-Packard and Varian Associates have shown that their respective pollutant plumes have migrated off their sites and have commingled in the shallow water bearing zone northeast of their sites. The shallow water containing pollutants is intercepted by the Oregon Expressway Underpass Dewatering System. This pumping system, which is under Board regulations (Order No. 87-129), then discharges the groundwater to the Matadero Canal at an estimated dry season flowrate of 350 gallons per minute.

9. During the course of investigative work at Hewlett-Packard 640 Page Mill Road, groundwater pollution was detected in a monitoring well installed at the former Mayfield School site located adjacent to both the Hewlett-Packard and Varian Associates sites. It is not known to what extent this pollution is associated with the Hewlett-Packard or Varian investigations or if an independent release on the Mayfield School site had occurred.

10. The former Mayfield School site at 2650 El Camino Real is owned by Stanford University and is currently unoccupied. The previous occupant, the Palo Alto Unified School District, leased the site until 1966, and from approximately 1966 to 1982, ran a manpower development training center/day care center and used the property as a storage facility.

11. Hewlett-Packard was provided staff guidance on February 4, 1987 which stated that the purpose of interim cleanup is to contain and to initiate the cleanup of the high concentrations of VOC's in the groundwater upgradient of El Camino Real. In a letter from the Executive Officer on May 27, 1987 Hewlett-Packard was formally notified that their report which recommends interim offsite groundwater cleanup alternatives was unacceptable because the proposed off-site groundwater remediation would not contain and remediate high concentrations of VOC's in a portion of the plume beyond the influence of the source area extraction well.

12. There are four backup municipal wells and several private wells downgradient from the Research Park the closest municipal well is approximately 1/2 mile to the northeast and the closest private well is approximately 1 1/4 mile to the northeast. The municipal wells were sampled in April 1985 and no pollutants were detected. Three of the private wells closest to the Stanford Research Park in the downgradient direction were sampled in fall 1985 and no pollutants were detected.

13. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for South San Francisco Bay and contiguous surface and groundwaters.

14. The existing and potential beneficial uses of the groundwater underlying and adjacent to the dischargers facilities include:

a. Industrial process water supply
b. Industrial service supply
c. Agricultural supply
d. Municipal and domestic supply

15. The dischargers caused or permitted waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.

16. The primary purposes of this Order are to require the timely and coordinated interim remediation by the dischargers of the commingled off-site pollutant plume in the vicinity of and upgradient of El Camino Real between Page Mill Road and California Avenue and to address the possibility of unidentified sources of groundwater pollution in the vicinity of the Mayfield school site migrating across El Camino Real. The interim and final remediation at the two known on-site source areas (Hewlett-Packard 640 Page Mill Road and Varian Associates 601 California Avenue) will continue to be regulated under the existing Orders (Hewlett-Packard Order No. 86-27; Varian Associates Order No. 87-039).

17. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of CEQA pursuant to Section 15321 of the Resources Agency Guidelines.

18. The Board has notified the dischargers and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharges and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

19. The Board, at a public meeting, heard and considered all comments pertaining to this discharges.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the dischargers shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS:

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect beneficial uses of the waters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS:

1. The storage, handling, treatment or disposal of polluted soil or groundwater shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The dischargers shall conduct monitoring activities as needed to define the local hydrogeolocical conditions, and the lateral and vertical extent of the soil and groundwater pollution. Should monitoring results show evidence of plume migration additional plume characterization of pollutant extent shall be required.

C. PROVISIONS:

1. The dischargers shall submit to the Board acceptable monitoring program reports containing results of work performed according to a program prescribed by the Board's Executive Officer.

2. The dischargers shall comply with Prohibitions A.1., A.2., and A.3., and Specifications B.1. and B.2. above, in accordance with the following time schedule and tasks:

COMPLETION DATE/TASK:

a. COMPLETION DATE: December 22, 1987

TASK: **QUALITY ASSURANCE PROJECT PLAN:** Submit a technical report acceptable to the Executive Officer containing a Quality Assurance Project Plan. The Quality Assurance Project Plan format and contents shall be consistent with CERCLA/SARA regulations and guidance.

b. 1) COMPLETION DATE: November 23, 1987

TASK: **DETERMINE ORIGIN(S) OF GROUNDWATER POLLUTION AT MAYFIELD SCHOOL SITE:** Submit a technical report acceptable to the Executive Officer containing a proposal to determine the origin(s) of groundwater pollution found at the Mayfield School site. Both on-site and off-site sources will be evaluated.

2) COMPLETION DATE: February 23, 1988

TASK: **COMPLETION OF IDENTIFICATION OF SOURCES** Submit a technical report acceptable to the Executive Officer documenting completion of the necessary tasks identified in the technical report submitted for Task 2.b.1 .

c. 1) COMPLETION DATE: November 23, 1987
TASK: **HYDROGEOLOGIC TESTING:** Submit a technical report proposing hydrogeologic tests to be performed which are necessary in order to evaluate interim cleanup alternatives e.g. pump tests, soil venting, etc.

d. 1) COMPLETION DATE: January 22, 1987

TASK: **INTERIM REMEDIAL ACTIONS:** Submit a technical report acceptable to the Executive Officer which contains an evaluation of alternatives for remediation of total volatile organic compounds (VOC's) in groundwater at concentrations greater than or equal to 1 ppm upgradient of El Camino Real between Page Mill Road and California Avenue and an implementation time schedule. This report shall evaluate alternative hydraulic control systems to contain and to initiate cleanup of polluted groundwater; and include a completed NPDES application to discharge to surface waters, if such discharge is an element of the plan.

2) COMPLETION DATE: June 22, 1988
TASK: **COMPLETION OF INTERIM REMEDIAL ACTIONS:** Submit a technical report acceptable to the Executive Officer documenting completion of the construction and startup of facilities described in the technical report submitted for Task 2.d.1).

e. 1) COMPLETION DATE: June 22, 1989

TASK:**EVALUATE INTERIM HYDRAULIC CONTAINMENT MEASURES:** Submit a technical report acceptable to the Executive Officer which evaluates the effectiveness of the interim hydraulic containment system. Such an evaluation shall include, but need not be limited to, an estimation of the flow capture zone of the extraction wells, establishment of the cones of depression by field measurements, and presentation of chemical monitoring data, if extraction wells are proposed.

f. 1) COMPLETION DATE: June 22, 1989

TASK: **PROPOSED FINAL CLEANUP OBJECTIVES AND ACTIONS:** Submit a technical report acceptable to the Executive Officer containing the results of the remedial investigation; an evaluation of the installed interim remedial measures; a feasibility study evaluating alternative final remedial measures; the recommended measures necessary to achieve final cleanup objectives; and the tasks and time schedule necessary to implement the recommended final remedial measures.

3. The provisions of this Order supercede the following provisions of the existing Orders shown below:

   1. Order No. 86-27 Provision 2.a. and 2.b. (to the extent these address the off-site portions of the plume).

   2. Order No. 87-039 Provisions 2.d.1, 2.d.2., 2.e.1., and 2.f. 1. (to the extent these address the off-site portions of the plume)

4. The submittal of technical reports evaluating immediate, interim and final remedial measures will include a projection of the cost, effectiveness, benefits, and impact on public health, welfare, and environment of each alternative measure. The remedial investigation and feasibility study shall be consistent with the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 25356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

5. If the dischargers are delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the dischargers shall promptly notify the Executive Officer and the Board may consider revision to this Order.

6. Technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted monthly to the Board commencing with the report due November 23, 1987 and covering the previous month. On a monthly basis thereafter, these reports shall consist of a letter report that, (1) summarizes work completed since submittal of the previous report, and work projected to be completed by the time of the next report, (2) identifies any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles, and (3) includes, in the event of non-compliance with Provision C.2. or any other Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order.

   On a quarterly basis, commencing with the report due February 23, 1987 the monthly reports shall include, but need not be limited to, updated water table and piezometric surface maps for all affected water bearing zones, cross-sectional geological

maps describing the hydrogeological setting of the site, and appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying adjacent facilities and structures.

7. The dischargers shall submit to the Board technical reports acceptable to the Executive Officer containing Site Safety Plans, and Site Sampling Plans.

8. Site Sampling Plans and Site Safety Plans shall be submitted for each task listed in Provision 2. and for conducting the Self-Monitoring Program. The Site Safety Plans, and Site Sampling Plans format and contents shall be consistent with CERCLA regulations and guidance documents.

9. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer. This requirement shall not apply to monthly reports and quarterly progress reports provided the hydorgeological information contained in these reports has been submitted or is scheduled for submittal by a registered geologist, engineering geologist, or professional.

10. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

11. The dischargers shall maintain in good working order, and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

12. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:

    a. Santa Clara Valley Water District
    b. Santa Clara County Health Department
    c. City of Palo Alto
    d. State Department of Health Services/TSCD
    e. State Water Resources Control Board
    f. U. S. Environmental Protection Agency, Region IX T41

    The Executive Officer may additionally require copies of correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order to be provided to a local repository for public use.

13. The dischargers shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:

a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

b. Access to copy any records required to be kept under the terms and conditions of this Order.

c. Inspection of any monitoring equipment or methodology implemented in response to this Order.

d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

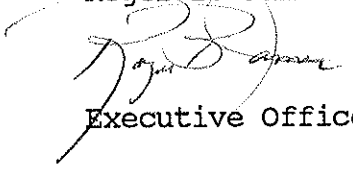
14. The discharger(s) shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order.

15. If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited where it is, or probably will be discharged in or on any waters of the state, the discharger shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.

16. The Board will review this Order periodically and may revise the requirements when necessary.

I, Roger B. James, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on October 21, 1987.

Roger B. James



Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

VARIAN ASSOCIATES
601 CALIFORNIA AVENUE
PALO ALTO, SANTA CLARA COUNTY

STANFORD UNIVERSITY
PALO ALTO, SANTA CLARA COUNTY

HEWLETT-PACKARD
640 PAGE MILL ROAD
PALO ALTO, SANTA CLARA COUNTY

ORDER NO. 87-142

CONSISTS OF

PART A, Dec. 1986
modified Jan. 1987
(w/Appendices A-E)

and

PART B,

PART B

VARIAN ASSOCIATES
STANFORD UNIVERSITY
HEWLETT-PACKARD
PALO ALTO, SANTA CLARA COUNTY

I. DESCRIPTION OF SAMPLING STATIONS

A.

Stations	Description
Hewlett-Packard monitoring wells: F21A1, F22A1, F36A2, F38A2, F41A2, F40A2	Groundwater monitoring wells
Varian monitoring wells: V-9, V9-A1	

II. MISCELLANEOUS REPORTING. None.

III. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis shall be that given in Table I (attached).

IV. MODIFICATIONS TO PART A.

All items of Self Monitoring Program Part A, dated December 1986 and as modified January 1987 shall be complied with except for the following:

A. Additions:

F.4.
"4. Total quarterly volume of spent activated carbon (in cubic feet) from each treatment unit and the disposal site location."

B. Deletions:

SPECIFICATIONS FOR SAMPLING AND ANALYSES (Section D)

STANDARD OBSERVATIONS (Section E)

C. Modifications: NONE

I, Roger B. James, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 87-142.

2. Was adopted by the Board on October 21, 1987.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer or Regional Board.

ROGER B. JAMES
Executive Officer

Attachments: Table I

TABLE 1
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

SAMPLING STATION >>>>	F21A1	F22A1	F36A2	F38A2	F41A2	F40A2	V-9	V9-A1
TYPE OF SAMPLE	G	G	G	G	G	G	G	G
Flow Rate (gal/day)								
pH (units)								
Temperature (deg. C)								
EPA 8010/8020 for: purgeable priority pollutants in addition to: Freon 113 xylene isomers	Q	Q	Q	Q	Q	Q	Q	Q
GC/MS Scan (EPA 8240)	1/Y	1/Y	1/Y	1/Y	1/Y	1/Y	1/Y	1/Y
Toxicity								
Well Water Level	Q	Q	Q	Q	Q	Q	Q	Q

LEGEND FOR TABLE 1

G = grab sample
D = once each day
M = once each month
Q = quarterly, once in March, June, September and December
M/Q = monthly for three months at startup of operation; reduced to quarterly thereafter
2/Y = Once in March and once in September
1/Y = once per year

* EPA 601/602 not required for months when EPA 624 is performed.